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RECORDS AND DESCRIPTIONS OF NEARCTIC CADDIS FLIES. PART 1.

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A recent study of several collections of Trichoptera seem to indicate that the Trichoptera fauna of nearctic North America is still quite inadequately known. Not only is the distribution of the mojority of the described species poorly known, but also it is probable that many new species remain to be described. In this paper the writer presents the descriptions of five new species and synoptic notes on a few interesting but practically unknown species. Unless otherwise indicated types of the new species are in the writer's collection.

Arctopsyche californica Ling

1943. *Arctopsyche divergens* Banks. Bulletin Museum Comparative Zoology. P. 368, Figs. 75, 80. (New Synonymy).

Arctopsyche californica was described by Ling in 1938 from a single male collected in Shasta County, Califonria. The description and figures of *divergens,* described from a male collected at Castella, California, agree very well with the type of *californica.* The figure of the male genitalia, fig. *1,* was prepared from a male collected at Patricks Creek, a tributary of Smith River, Del Norte County, California, June 16, 1949, S. G. Jewett, Jr., to which the holotype of *californica* was compared and found identical except for a few minor variations. The short gradually diveregnt prongs of the tenth tergite, the pair of large dorsad curved spines arising from the ventral portion of the tenth tergite and the presence of a small pair of spines on the dorsal surface of the aedeagus will serve for a quick identification of the species.

I would like to express my thanks to Dr. Edward S. Ross of the

California Academy of Sciences who kindly loaned me the type of *californica.*

Arctopsyche inermis Banks

This species was described by Banks in 1943 from a series of specimens collected in Summit County, Colorado, at an elevation of 8211 feet. No additional distributional records have since then been recorded in the literature. Since there was some confusion regarding this species a study of a male paratype, kindly loaned to the writer by Dr. J. Bequaert of the Museum of Comparative Zoology, was made. On the basis of the convergent acuminate prongs of the tenth tergite, as shown in fig. *2*, this species can readily be separated from *grandis* Banks its closest relative.

California: Santa Catalina Mts., August 7, 1939, (J. A. Comstock), 1 ♂ (Los Angeles County Museum Collection).

Montana: Cameron Bridge, West Gallatin River, Gallatin County, June 15, 1949, (S. L. Rowe), 10 ♂, 14 ♀. Mouth of Deer Creek, West Gallatin River, Gallatin County, June 24, 1949, (D. R. Orcutt), 46 ♂, 5 ♀. (Montana State College collection).

Oregon: Willamette River, near Oakridge, June 27, 1948, (D. G. Denning), 10 ♂.

Utah: Hanna, July 4, 1949, (J. R. White), 4 ♂. (University of Kansas Collection).

Wormaldia thyria n. sp.

Male.—Length 6–6.5 mm. General color of wings fuscous, appendages yellowish. Front and hind wings both with R_{2+3} branched and M_{3+4} unbranched. Seventh abdominal sternite with apical margin produced into a broad triangular process, fig *3A*, eighth sternite produced into a short triangular process. Genitalia as in figure *3*. Ninth segment annular, caudal margin produced cephalad as a bluntly rounded projection partially covered by the eighth sternum and tergum. Tenth tergite tapering to a triangular apex, undivided, devoid of setae, fig. *3B*. Cerci elongate, slender, setation sparse, fig. *3B* as long as tenth tergite, apex blunt. Basal segment equal in length to apical segment, dorsal margin broadly rounded; apical segment constricted beyond base, apex circular, setae rather dense, apex bears a pad of dense reddish spicules on mesal surface.

Holotype.—Male; Neels Creek, Mt. Mitchell, North Carolina, Game Refuge; May 30, 1949; (J. F. Hanson).

Paratype.—1 ♂; Same data as for holotype. Deposited in the collection of the University of Massachusetts.

Ross (1949) separated the nearctic species of Wormaldia into three groups based on the male genitalia. Accordingly, *thyria* would then be placed in the *Moesta* group which Ross further divided into three subgroups based on the mesal projection of the seventh sternite. *Thyria* belongs in the third subgroup, along with *strota, sisko, occidea* and *shawnee;* it is most closely related to the latter two species.

Nyctiophylax zelenus n. sp.

This represents the fourth species in the genus to be described from the United States. It can easily be distinguished from *vestitus* (Hagen), *uncus* Ross and *celta* Denning by the large apico-mesal lobe and the absence of a lateral lobe on the clasper, fig. *4A* .

Male.—Length 7 mm. Wings light brown, antennae, palpi, legs and spurs light yellow. General characteristics typical of genus. Male genitalia as in fig. *4*. Tenth tergite very lightly sclerotized, apical margin incised, forming a pair of short setiferous points. Cerci quadrate, apical margin very irregular in outline; ventro-mesal portion projected ventro-caudad as a prominent heavily sclerotized process, its apex acute and distinctly hooked. Clasper, seen from lateral aspect, with base rounded, posterior surface deeply concave, apex narrowed into a single dorsad curved lobe; seen from caudal view, fig. *4A,* mesal lobe large, subtriangular. Aedeagus light brown, somewhat tubular, apex broadly ovate, dorsal rods heavily sclerotized, acuminate, projecting caudad slightly beyond cerci but not beyond aedeagus as in *vestitus*.

Holotype.—Male; Rio Frio River, Concan, Uvalde County Texas; April 14, 1949; (R. H. Beamer). Deposited in the University of Kansas collection.

Nyctiophylax vestitus (Hagen)

Since *vestitus* has not been recorded in the western part of the United States the following records are of interest.

Wyoming: Sheridan, June 20, 1947 (D. G. Denning), July 24, 1948 (D. G. Denning); Buffalo, July 30, 1948 (R. E. Pfadt); Platte County, Laramie River, August 1–12, 1949, light trap.

British Columbia; Cowichan Lake, August, 1940, (C. P. Idyll).

Polycentropus gertschi n. sp.

The presence of the triangular projection on the mesal surface of the claspers, the narrow elongate cerci, and the scoop-like acuminate ventral sheath of the aedeagus will readily distinguish *gertschi* from other desscribed species in the genus.

Male.—Length 8 mm. Both pairs of wings light brown, dorsal portion of head and thorax brownish, ventral portion of each, legs, spurs, palpi and antennae light yellow; eyes black. General characteristics typical for genus. Male genitalia as in fig. *5*. Sternite and tergite of eighth segment unmodified. Ninth sternite about twice as wide as long; ninth tergite membraneous. Tenth tergite membraneous, extending caudad beyond cerci; from dorsal aspect appears broadly ovate, flanked on each side by a pair of slender finger-like processes extending caudad nearly as far as claspers, apex bearing several long, fine setae. Cerci elongate, narrow; dorsal portion extending caudad as an ovate process; ventral portion narrowed to an acute ventrad directed apex. Claspers, when seen from the lateral aspect, sub-quadrate, dorsal margin rounded, ventral margin nearly straight, projecting beyond remainder as a hook; from caudal aspect, fig. *5A*, mesal margin produced into a prominent, mesad directed, triangular point. Ventral sheath of aedeagus projected ventrocaudad as a gradually narrowed acute projection. Aedeagus tubular; internally three pairs prominent spines grouped together near apex, two pairs of heavily scleratized spines near base.

I take great pleasure in naming this new species in honor of the collector, Dr. Willis J. Gertsch of the American Museum of Natural History.

Holotype.—Male; Oak Creek Canyon, Arizona; July 22, 1949; (W. J. Gertsch). Deposited in the collection of the American Museum of Natural History.

Chimarra primula n. sp.

This species bears little resemblance to other described species, it can easily be identified by the claspers which are approximately in the shape of a parallelogram.

Male.—Length 8 mm. Color of wings and body dark brown, appendages a trifle lighter in color. General characteristics typical for genus. Genitalia as in fig. *6*. Ninth segment with ventral portion wide and bearing a very short mesal projection; dorsal portion greatly reduced, fused to near base of tenth tergite. Tenth tergite divided into a pair of lateral lobes; seen from lateral aspect, fig. *6*, apical margin truncate, a short acute dorsal angulation near apex; seen from dorsal aspect, fig. *6A*, lateral lobes gradually convergent, widened apically, apical margin straight, a short acute point near apex on lateral margin; mesal lobe membraneous, triangular. Cerci small, sub-ovate, clothed with a few scattered setae. Claspers considerabley longer than wide, ventral and dorsal margins almost straight, nearly parallel, apical margin rounded; from dorsal aspect, fig. *6B*, a prominent short quadrate process arises near base and projects mesad; seen from ventral aspect a short blunt dorsad directed process arises from mesal margin near base. Aedeagus long, tubular; internally two long straight heavily scleratized rods are plainly discernible.

Female.—Length 9 mm. Color and general structure similar to male. Genitalia apparently indistinguishable from others in the genus.

Holotype.—Male; Oak Creek Canyon, Arizona; June 19, 1949; (D. G. Denning).

Allotype.—Female; same data as for holotype.

Paratypes.—1 ♂, 4 ♀; same data as for holotype.

Chimarra beameri n. sp.

The acuminate apex of the clasper when seen from the dorsal or ventral aspect, the abruptly narrowed apex of the clasper when seen from the lateral aspect, and the peculiar tenth tergite bearing two acute triangular tubercles will easily distinguish this species from others in the genus.

Male.—Length 6 mm. Wings, body, head and antennae fulvous, appendages luteous, spurs fuscous, outer claw of front leg very large, about two and one half times length of inner. Genitalia as in fig. *7*. Ventral portion of ninth sternum wide, partially covered by eighth sternum, mesal process short, broadly rounded; apical margin nearly straight. Lateral lobes of tenth tergite extend slightly beyond aedeagus, seen from lateral aspect, fig. *7*, apical margin tapering to a sub-acute apex, two short tubercles bearing a short spine-like seta are discernible on dorsal surface; seen from dorsal aspect, fig. *7A*, lateral margin with a prominent angulation about midway and another near apex, one pair of short tubercles located about midway between base and apex. Cerci auricular, setae sparse. Claspers with base narrow, apico-ventral corner broadly rounded; dorsal portion abruptly narrowed to an acute apex, entire structure curved mesad; from ventral aspect, fig. *7B*, rounded condition of clasper and acute apex plainly discernible, mesal surface near base bears a pair of short tubercles each bearing a long seta. Aedeagus long, tubular, bearing a pair of long slender black rods internally.

I take great pleasure in naming this new species in honor of the collector, Dr. R. H. Beamer of the University of Kansas.

Holotype.—Male; Rio Frio River, Concan, Uvalde County Texas; April 14, 1949; (R. H. Beamer). Deposited in the University of Kansas collection.

Chimarra moselyi Denning

1948. *Chimarra perigua* Ross. New Nearctic Rhyacophilidae and Philopotomidae (Trichoptera). P. 24, Figs. 7, 7A. (New Synonymy).

Records given for *moselyi* and *perigua* indicate that *moselyi* is quite widespread in southeastern United States, extending north to Illinois.

REFERENCES

Banks, Nathan, 1943. Notes and Descriptions of Nearctic Trichoptera. Bull. Museum Comp. Zoology. XCII: 341–369. 138 figs.

EXPLANATION OF PLATE II

FIG. 1. *Arctopsyche californica*, male genitalia, lateral aspect, 1A, tenth tergite, dorsal aspect.

FIG. 2. *Arctopsyche inermis*, male genitalia, lateral aspect; 2A, tenth tergite, dorsal aspect.

FIG. 3. *Wormaldia thyria*, male genitalia, lateral aspect; 3B, tenth tergite, dorsal aspect.

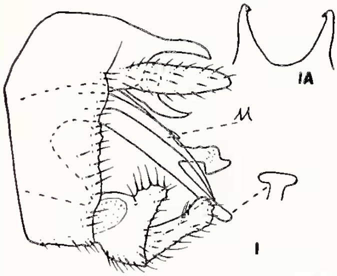
FIG. 4. *Nyctiophylax zelenus*, male genitalia, lateral aspect; 4A, clasper, caudal aspect.

FIG. 5. *Polycentropus gertschi*, male genitalia, lateral aspect; 5A, clasper, caudal aspect.

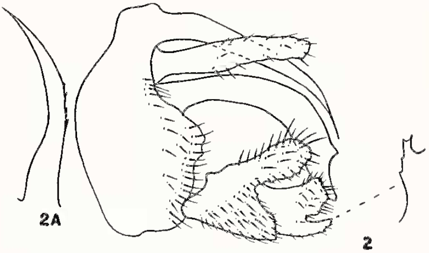
FIG. 6. *Chimarra primula*, male genitalia, lateral aspect; 6A, tenth tergite, dorsal aspect; 6B, base of clasper, dorsal aspect.

FIG. 7. *Chimarra beameri*, male genitalia, lateral aspect; 7A tenth tergite, dorsal aspect; 7B, clasper, ventral aspect.

BULL. B. E. S. VOL. XLV PLATE II



ARCTOPSYCHE CALIFORNICA



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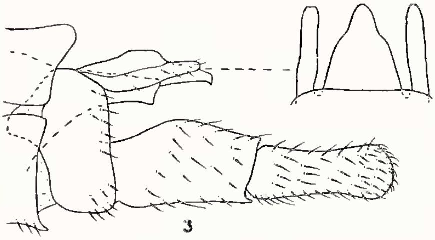
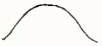
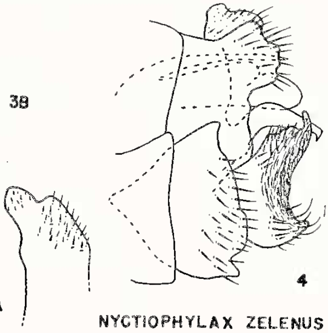
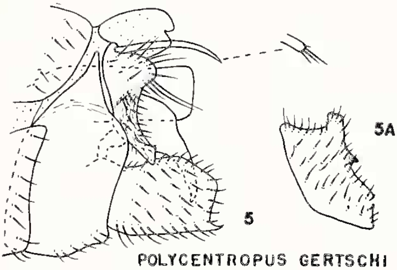




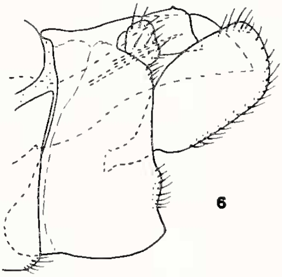
WORMALDIA THYRIA

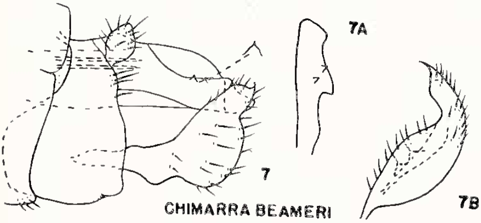


NYCTIOPHYLAX ZELENUS

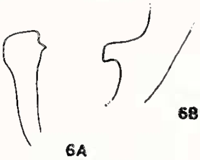


POLYCENTROPUS GERTSCHI





CHIMARRA BEAMERI



CHIMARRA PRIMULA

Denning, D. G, 1947. New Species of Trichoptera from the United States. Ent. News. LVIII. 249–257. 10 figs.

Ling, Shao-Win, 1938. A few Caddis flies in the collection of the California Academy of Sciences. Pan-Pacific Ent. XIV: 59–69.

Ross, H. H., 1948. New Nearctic Rhyacophilidae and Philopotamidae (Trichoptera). Ent. Soc. Amer. Ann. XLI: 17–26. 8 figs.

————, 1949. A Classification for the Nearctic Species of Wormaldia and Dolophilodes (Trichoptera, Philopotamidae). Ent. Soc. Wash. Proc. *51:* 154–160. 4 figs.

A Nemestrinid Bred from a Grasshopper in the United States. Although the larvae of most, if not all, Nemestrinidae appear to be parasitic in Orthoptera, there are as yet few published records of specimens actually bred from the host. G. J. Spencer (1945), in British Columbia, obtained *Neorhynchocephalus sackenii* (Williston) from *Melanoplus m. mexicanus,* and *Trichopsidea (Parasymmictus) clausa* (Osten Sacken) from *Camnula pellucida* and "other grasshoppers." Professor D. G. Denning now sends me a female *T. clausa,* bearing a notation that it was reared on January 2, 1942, by R. D. Pfadt, from *Metator pardalinus* (Saussure), collected at Manville, Wyoming. This is the first specimen bred in the United States that has come to my notice, although there may be unpublished cases in certain files.—J. Bequaert, Museum of Comparative Zoölogy, Cambridge, Mass.